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UNITED STATES DEPARTMENT OF AGRICULTURE

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Contribution from the Forest Service,
HENRY S. GRAVES, Forester

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FOREST CONSERVATION FOR STATES IN THE SOUTHERN PINE REGION.

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THE SITUATION SUMMED UP.

A situation confronts the States of the southern pine region—Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Misissippi, Louisiana, Texas, Arkansas, and Missouri—which, unless met and controlled by adequate legislation, threatens seriously to affect their future development and prosperity. The situation arises from the removal of the pine and hardwood forests without proper provision for restocking those cut-over areas, valuable chiefly for the growing of timber, and from the destruction by fire of the young trees and other vegetation on watersheds of important rivers, which carries with it increased erosion, the silting up of stream channels, and danger from floods.

If cutting continues at the present rate without provision being made for new timber crops, southern yellow pine will in the course of time cease to be an important commercial resource of the South. It is now one of the chief sources of wealth, but it is probable that

NOTE.—The bulletin points out the essential elements in the various forest problems that confront the States in the southern pine region, shows how these problems are interrelated, and forms a basis on which may be founded a plan for solving them—matters of great importance to lumbermen, farmers, and all others interested directly or indirectly in the conservation of the timber resources of that region.

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the annual cut has already reached the high point. If pine is to continue to play an important part in commerce and industry in the South, steps will have to be taken now to protect cut-over areas from fire and unrestricted grazing, and to manage them in a way to insure continuous production.

Investigations have shown that the removal of the forest ground cover by repeated fires has increased the amount of soil washed into such streams as the James, Roanoke, Wateree, Savannah, Alabama, Pearl, Red, Arkansas, Trinity, Brazos, and Colorado (of Texas). Great sums of money are spent annually in dredging work to remove sand bars from the rivers of this region. Bare ground from which rain runs off as quickly as it falls also increases the danger from floods; and floods in the Southern States have in the past caused millions of dollars damage to property and the loss of many lives. Watershed protection will not of itself prevent floods, but it will lessen their frequency and seriousness; and it will prevent excessive erosion over the whole area covered.

The solution of such problems as these is necessary to the future welfare of the whole community, and experience has demonstrated beyond question that they can be solved satisfactorily only through public action. Adequate forest legislation would involve in each State:

(1) A nonpartisan department of forestry.

(2) A technically trained forester as State forester.

(3) A forest fire protective system.

(4) Cooperation with private owners and towns in preparing plans for the management of timberlands and woodlots and for commercial and shade tree planting.

(5) State-owned forests by gift or purchase.

(6) An adequate appropriation of funds.

Besides the steps just outlined, each State might well make an examination of its own lands (if it possesses any), and withdraw from sale those chiefly valuable for timber production, setting them aside as State forests. Measures might also be taken to restrict the running at large of live stock.

The southern pine States lie in a region especially favorable to the rapid growth of desirable tree species and offer an exceptional opportunity for the practice of forestry. Virginia, North Carolina, and Texas already have adopted forest policies, but their combined yearly appropriations for putting them into effect amount to less than $20,000.

At the request of each of the States in the southern pine region, except Georgia, and in cooperation with them, the Forest Service

has made studies of their forest conditions and reports have been prepared and, in most cases, published either by the State or by the Service.[1]

WHAT THE LUMBER INDUSTRY MEANS TO THE SOUTHERN PINE STATES.

The manufacture of lumber and other timber products ranks first among the industries of Alabama, Arkansas, Mississippi, and Virginia. It ranks second among the industries of Florida, Georgia, Louisiana, and South Carolina, third among those of North Carolina and Texas, and sixth among those of Missouri. Something like 16,000 sawmills operate in these States, and a large number of additional establishments manufacture cooperage stock, veneers, and other forest products. These plants employ some 330,000 persons, or about one-third of all the workers engaged in the various industries. The average annual lumber cut in the region amounts to about 19,500,000,000 board feet, of which approximately three-fourths is yellow pine. Assuming an average value for the lumber of $14 per thousand feet, the total value of the annual cut would amount to nearly $275,000,000. About a quarter of this sum represents the value of the stumpage from which the lumber is manufactured; the greater part of the remainder is paid out in the form of wages to residents of the region.

The amount of standing timber in the southern pine region has been estimated by the Bureau of Corporations and the Forest Service as 675,000,000,000 board feet, of which 385,000,000,000 feet is yellow pine, 40,000,000,000 feet cypress, and the remainder principally hardwoods. At the present rate of cutting this amount will last scarcely more than 35 years. Should there remain no commercial bodies of yellow pine or prospect of any, after the present stands are exhausted, the resultant loss to the people of the Southern States in business and wages will be very seriously felt.

The naval-stores industry, which is one of the most important in the South and which depends upon yellow pine as a source of supply

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[1] "Forest Conditions in Virginia and Proposed Measures for Forest Protection," by W. W. Ashe, House Doc. No. V, Communication from the Governor, 1910;
"Forest Conditions in Western North Carolina," by J. S. Holmes, Bull. No. 23, N. C. Geol. and Econ. Surv., 1911;
"Forest Conditions in South Carolina," by W. M. Moore, Bull. No. 1, State Dept. of Agric., Com. and Ind., 1910;
"Condition of Cut-over Longleaf Pine Lands in Mississippi," by J. S. Holmes and J. H. Foster, Circ. 149, U. S. Dept. Agric., For. Ser., 1908;
"Forest Conditions of Southwestern Mississippi," by J. S. Holmes and J. H. Foster, Bull. No. 5, Miss. State Geol. Surv., 1908;
"Forest Conditions of Mississippi," by C. E. Dunston, Bull. No. 7, Miss. State Geol. Surv., 1910;
"Forest Conditions in Louisiana," by J. H. Foster, Bull. No. 114, U. S. Dept. Agric., For. Ser., 1912;
"Forest Resources of Texas," by William L. Bray, Bull. No. 47, U. S. Dept. Agric., Bur. For., 1904;
"A Forest Policy for Texas," by J. G. Peters, San Antonio Express, Jan. 17, 1915;
"The Forest Resources of Arkansas," by Samuel J. Record, Circular of State Land Commissioner, 1910;
"Forest Conditions of the Ozark Region of Missouri," by Samuel J. Record, Bull. No. 89, University of Missouri, Agric. Exp. Sta., 1910.

for turpentine and rosin, has an annual output valued at approximately $30,000,000. This industry, too, must either cease to exist or else move its operations to other portions of the country, unless provision is made now for a future supply of timber suitable for turpentining.

FOREST FIRES.

The chief obstacle in the way of the conservation of the region's timber supply is forest fires. These kill many trees of merchantable size, destroy young trees and seedlings which otherwise would form the basis for new timber crops, consume the ground cover and soil humus, leaving the earth bare and subject to erosion, and sometimes destroy human life.

As long ago as 1879, according to figures gathered for the entire region in the Tenth Census, 729 fires burned more than 5,000,000 acres, causing a money loss in salable products and improvements of $2,250,000. This estimate was undoubtedly low at the time that it was made, since conditions were not favorable for gathering complete figures.

While no other attempt has been made to obtain figures for the entire region, the present annual loss is unquestionably much greater, since the construction of railroads, the development of lumbering, and the practice of brush burning have gone on steadily. North Carolina is the only State in the southern pine region for which data on the present damage from fire are available. During the five-year period from 1909 to 1913 the average number of fires reported per year in North Carolina was 633; the average area burned about 415,000 acres, and the average loss as follows:

Value of timber destroyed	$160,000
Value of young growth destroyed	204,000
Value of forest products destroyed	218,000
Value of improvements destroyed	66,000
Total damage	$648,000
Number of lives lost	2
Cost to private individuals to fight fire	$19,000

Concerning the value of young growth destroyed the State Forester of North Caroline says:

> The growing realization of the value of unmerchantable young growth is perhaps the chief reason for the apparently high money loss. Whereas in 1911, the first year any general estimate was placed on destroyed young growth, the loss from this one cause amounted to only 25 per cent of the total damage, in 1912 it comprised 33 per cent, while in 1913 it has increased to 45 per cent of the total estimated damage. An instance of the growing recognition of the destructiveness of woods fires comes from Transylvania County. A farmer there claimed $300 reduction in the tax valuation of his place because 300

acres had been burnt over. This reduction was granted by the county commissioners. The county therefore lost several dollars in taxes every year from that one fire, besides the much more serious loss sustained by the farmer.

In North Carolina the destruction of mature timber is only a small part of the fire damage, because the usual surface fires, unless occurring late in the spring, do not kill the larger trees. For this reason the value of the reproduction and young growth destroyed necessarily assumes large proportions.

And further concerning the total loss:

The very serious annual loss from forest fires can perhaps best be brought out by a comparison. The average loss from fires in North Carolina for the past five years has been about $650,000 a year. This is equivalent to a tax levy of 36 cents on the $100 on all the land in the State, or a tax of 13 cents on the $100 on all property, real and personal, now listed for taxation. How quickly would this fire tax be done away with if it came in the form of a regular tax levy! Yet the fire tax is paid year after year by the people of North Carolina without a murmur. One or two per cent of the amount lost, if properly spent by the State, would reduce the fire damage one-half the first year, and not only save much valuable property belonging to our citizens, but insure the future well-being of the State.

With the North Carolina figures as a basis, the average yearly damage from forest fires in all of the States of the southern pine region may be estimated as 3,500,000 acres burned over, with a money loss of $6,500,000. If to this were added the losses from soil deterioration and floods, the damage would be far greater.

Damage to the forests in this region is confined principally to the young growth. This is especially noticeable on the cut-over longleaf pine lands, which are burned over every spring and fall and so kept in a practically barren and waste condition. Except on the bottom lands, damage of this character prevails in all the forests and is generally severe.

Some of the cut-over lands will undoubtedly be devoted to agriculture, but in the meantime fire and erosion are robbing them of valuable chemical and physical elements. Should they be kept in trees as a means of retaining their fertility until demanded for cultivation, their value will certainly be higher than if they are allowed to deteriorate through neglect. This is especially true of the less valuable agricultural areas.

In many places the disposal of cut-over pine lands for farming purposes will go on very slowly. A merchantable crop of longleaf pine trees for pulpwood can be grown naturally in 30 years if protected from fire. Commercial shortleaf and loblolly pines can be grown in even a shorter time. Consequently, a real opportunity is presented of utilizing the cut-over areas profitably while awaiting the time for their agricultural development.

Besides the cut-over lands suitable for agriculture, there are large areas valuable chiefly for the production of timber. Land should,

and will eventually, be put to its most profitable use—real farming land to agriculture, real forest land to timber culture. For the present, however, all land which is not actually under cultivation or needed for pasture purposes should be in timber, as a means of maintaining productiveness and of conserving the fertility of such parts of it as will eventually be put to agricultural use.

The exclusion of fire from cut-over areas will practically insure new stands of timber in place of the old. Little or no planting will be necessary. The abundant reproduction of yellow pine wherever the young growth has escaped the ravages of fire is evidence that yellow pine will reproduce itself naturally if only given a chance.

The protection of cut-over lands from fire will, of course, entail an expenditure, the full burden of which most private owners of timberland will hardly feel themselves in a position to bear on account of the long time element involved in growing future crops of timber. This is the situation in practically all the large forest areas in the United States, and many of the individual States are recognizing the public interest involved by assisting in the protection of such lands. Another and very important reason for State aid in forest fire protection, and one which is especially strong in the southern pine region, is the danger from floods, which is greatly increased by the destruction of the forest cover on the watersheds of streams. Losses from floods along the Southern Appalachian streams alone during the ten years preceding 1908 aggregated more than $35,000,000.[1] Floods, erosion, and soil washing are together a serious menace to the steady development and continued prosperity of the southern States. Control of forest fires is one means of removing their cause.

Forest fires occur in the southern pine region, because there is little or no public sentiment against them. They are accepted as inevitable and as uncontrollable. This, however, is just the opposite of the truth. Experience elsewhere has demonstrated that most fires can be prevented; with prompt action all fires can be controlled. The problem is largely one of education; public opinion must be focused upon the subject. The fact must be constantly reiterated that forest fires can be prevented with a little care, and that, unless they are prevented, the welfare of every citizen of the State is affected. Education of this kind can only be effectively carried on through organized effort on the part of the State. The value of a protective force patrolling the woods, warning persons against the careless use of fire and securing their good will and cooperation in preventing and extinguishing fires, has been demonstrated over and over again by a prompt and impressive decrease in fire loss in every State where it has been tried. The States in the southern pine region have all

[1] Preliminary Report of the Inland Waterways Commission, 1908, page 522.

passed punitive laws against setting fires. What are needed now are laws providing for the establishment of a protective system and funds to maintain it. Virginia, North Carolina, and Texas have recently enacted such legislation. It will be to the lasting advantage of the other States in the region to follow the example of these three.[1]

Closely related to forest fires is the destruction of timber by insects, since the damage done by fire affords entrance for the beetle into the timber, while trees damaged by insects are particularly liable to destruction by fire. Although not generally recognized, insect attacks may cause widespread and serious damage to pine timber in the South. Since 1902 the southern pine beetle has been more or less active in the Southern States from Virginia to Texas, and in some localities has killed a large amount of timber. It is not within the scope of this bulletin to discuss insect depredations, but any State which plans to inaugurate a forest policy should communicate with the Bureau of Entomology, Department of Agriculture, Washington, D. C., for advice regarding the best means of preventing injury to timber from this source.

UNRESTRICTED GRAZING.

Wherever stock is permitted to run at large, it is the general practice to fire the woods once or twice a year in the belief that this improves the forage. Fires set for this purpose cause great damage to the young growth and do not make the grass any better. As a matter of fact, continued burning reduces the vitality of the better grasses, which are then replaced by less desirable ones. More than this, if fires were kept out new grass would actually make better growth, partly as a result of receiving protection from the older grasses; and often a mixture of new and old grass makes much more satisfactory feed for cattle than new grass alone.

Damage to the forest, especially in the longleaf pine region, is caused by hogs devouring pine seeds and tearing up pine seedlings for their tender roots. The amount of such damage, when the whole region is taken into account, is really large and must be reckoned with.

The grazing problem can be solved in large measure by impressing upon the farmers and landowners the fact that in the long run the forage is injured instead of being improved by fire in the woods every year and by making the most of local laws which prohibit stock being run at large. The best and surest means, however, of putting an end to the damage to woods and forage is a State-wide law compelling the inclosure of stock.

[1] Virginia, chap. 195, laws 1914; North Carolina, chap. 243, public laws, 1915; Texas, chap. 141, laws, 1915.

FOREST MANAGEMENT.

With a few exceptions, no attempt is made in the southern pine region to manage private forests for continuous production. Nor is this done in the United States generally. Present economic conditions make necessary the lumbering of the larger holdings on a big scale. This means a large annual cut accompanied by rapid depletion of the merchantable timber supply. Even where curtailment might otherwise be possible, it is frequently prevented by a heavily bonded indebtedness, on which the necessary payments must be made with the proceeds from the annual cut of timber. Nowhere is this more often the case than in the southern pine region. The farmer also often sacrifices his woodlot to meet indebtedness. Yet even where it is possible for the lumberman or farmer to cut his timber only as the market and his personal needs may require, he usually does the cutting without reference to a future crop of timber on the same land.

To meet this problem the States of the southern pine region need to investigate economic conditions in the lumbering and farming districts, with the idea of giving advice to private owners as to how far the practice of forestry may pay in dollars and cents. Assistance should also be offered in the planting of trees on waste areas and in the prairie regions and in shade-tree planting in towns and cities. It is customary for the owner or town to pay the agent's field expenses, while the State pays his salary. All States with forestry departments have provided for work of this character.

STATE-OWNED FORESTS.

Large areas of true forest land should be owned by the State, since it is better able than the private owner to hold the land for continuous timber production and for stream-flow protection. Public ownership, furthermore, guarantees a permanent administration of the properties. The stability of the lumber industry may thus be assured, and with it, steady employment for the wage earner. The educational effect of public forests as demonstration areas is very important and may be productive of excellent results. Public forests can also be used as recreation grounds by the people of the State, and may eventually become an attraction for tourists and pleasure seekers from other parts of the country. They also afford range and breeding ground for game. Through revenue from timber sales and other privileges they should become self supporting. In some cases sufficient revenues should be derived from them to go to the support of other State activities as well.

Nearly every State which has given serious attention to its forest problems has provided for the establishment of publicly owned for-

ests. Those now having State forests are Connecticut, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, South Dakota, Vermont, and Wisconsin. The number of State forests is approximately 150 and their aggregate area 3,700,000 acres. New York has 1,800,000 acres, Pennsylvania 1,000,000, Wisconsin 400,000 acres, and Michigan 277,000 acres. At a recent election the people of Minnesota approved an amendment to the constitution permitting the State to set aside as State forests all lands now owned by it which are chiefly valuable for the production of timber, amounting to about a million acres.

Practically all of these State forests have been established through purchase, although in the West some were set aside from lands already owned by the States. New York has spent approximately $4,075,000 and Pennsylvania $2,250,000 in buying lands for State forests. Pennsylvania has paid about $2.25 an acre for the same land, cut over and burned, which it sold years ago, when covered with timber, for about 27 cents an acre. These lands are now estimated to be worth $6 an acre.

The Federal Government, under the terms of the so-called Weeks law, has also adopted this policy as regards lands situated on the forested watersheds of navigable streams and has appropriated $11,000,000 for purchases.

It is probable that the States in the southern pine region have disposed of nearly all their timber holdings. Just how much of such land, which can be used most profitably for growing timber, remains in the ownership of the States should be determined as soon at practicable and steps taken to withdraw it from sale and set it aside as State forests. In addition, these States should gradually acquire, through purchase or gift, other bodies of true forest land, especially in regions like the Southern Appalachians, the pine hills, and the Edwards Plateau in Texas. When lands are taken over by a State provision should be made to reimburse the counties and the townships for loss of tax revenue. Some States pay a tax on the same basis as if such lands were privately owned; others pay a fixed charge of a few cents an acre. The Federal Government gives counties in which National Forests are situated 25 per cent of the gross revenues, and an additional 10 per cent is used, in cooperation with the localities concerned, for the construction of public roads.

LEGISLATION.

A consistent and comprehensive forest policy can be carried out only through a forestry department and a State forester. Such departments are urgently needed and earnestly recommended. They have been established in only three States in the southern pine re-

gion—Virginia, North Carolina, and Texas. Louisiana has provided by law for a forestry department under the State Conservation Commission, but for lack of funds it has never been organized. Alabama endeavored to establish a forestry commission, but the law authorizing it was declared unconstitutional on account of an error in the procedure of enactment.

Thirty States have established forestry departments. Some have placed them under departments already established, namely, the board of agriculture in Colorado and Vermont; agricultual experiment station in Connecticut, Kansas, and Ohio; geological survey in North Carolina and Virginia; agricultural and mechanical college in Texas; State school of forestry in North Dakota; State land department in Idaho, Montana, and South Dakota; and forest, fish, and game department in Tennessee and West Virginia. New and separate organizations have been created as forestry boards or commissions by California, Indiana, Kentucky, Maryland, Minnesota, New Hampshire, Oregon, Pennsylvania, and Washington. New Jersey, New York, and Wisconsin have consolidated their forestry departments with so-called allied departments into conservation commissions, and, similarly, Michigan has put the forestry work under a public-domain commission. Maine, Massachusetts, and Rhode Island have given control to a forest commissioner or State forester, who, as in the case of the board or other organization, is directly responsible to the governor or the legislature.

Whatever the character of the organization may be, the best results will be obtained by keeping it free from politics. If a single officer directs it, his tenure of office should be permanent and he should be removable only for cause. If a new and separate board is organized, it should be nonpartisan and the members should receive no compensation other than necessary traveling expenses. The ex officio membership of the board should comprise officials who are removed from politics as far as possible, such as the president of the State University, director of the State forest school or agricultural experiment station, and the State geologist. Appointees to the board might be chosen, as in some States, upon the recommendation of organizations interested in the advancement of forestry in the State, such as conservation, forestry, agricultural, lumbermen's, or timber owners' associations.

The State forester should be chosen solely for his fitness for the position and should be a technically trained forester of experience. If he is to work under the direction of a board he should be appointed by the board.

The forestry department should be authorized especially to organize a forest-fire protective system; to cooperate with private owners and towns; to acquire lands for State forest purposes; and

to make forest investigations. A reasonably adequate appropriation of funds will be required to carry on the work.

As an example of a law which provides for these features may be cited that which was recently passed by the Legislature of Texas. This measure is brief and simple. The Texas Forestry Association was organized by a number of public-spirited citizens especially to do educational work on its behalf, and the press throughout the State gave very generously of space in both news and editorial columns for the same purpose. The law follows:

An act authorizing the board of directors of the Agricultural and Mechanical College to appoint a State forester, prescribing his qualifications, duties, and salary, providing for a system of forest protection, management, and replacement, and declaring an emergency.

Be it enacted by the Legislature of the State of Texas:

SECTION 1. That there shall be appointed by the board of directors of the Agricultural and Mechanical College of Texas a State forester, who shall be a technically trained forester of not less than two years' experience in professional forestry work. His compensation shall be fixed by said board at not to exceed $3,000 per annum, and he shall be allowed reasonable traveling and field expenses incurred in the performance of his official duties. He shall, under the general supervision of said board, have direction of all forest interests and all matters pertaining to forestry within the jurisdiction of the State. He shall appoint, subject to the approval and confirmation of said board, such assistants and employees as may be necessary in executing the duties of his office and the purposes of said board, the compensation of such assistants and employees to be fixed by the said board. He shall take such action as may be deemed necessary by said board to prevent and extinguish forest fires, shall enforce all laws pertaining to the protection of forest and woodlands, and prosecute for any violation of such laws; collect data relative to forest conditions, and to cooperate with landowners as described in section 2 of this act. He shall prepare for said board annually a report on the progress and condition of State forestry work, and recommend therein plans for improving the State system of forest protection, management and replacement.

SEC. 2. That the State forester shall, upon request, under the sanction of the board of directors, and whenever he deems it essential to the best interests of the people of the State, cooperate with counties, towns, corporations, or individuals in preparing plans for the protection, management, and replacement of trees, woodlots, and timber tracts, under an agreement that the parties obtaining such assistance pay at least the field expenses of the men employed in preparing said plans.

SEC. 3. That the governor of the State is authorized, upon the recommendation of the board of directors, to accept gifts of land to the State, same to be held, protected, and administered by said board as State forests, and to be used so as to demonstrate the practical utility of timber culture and water conservation, and as refuges for game. Such gifts must be absolute, except for the reservation of all mineral and mining rights over and under said lands, and a stipulation that they shall be administered as State forests.

The board of directors shall have the power to purchase lands in the name of the State, suitable chiefly for the production of timber, as State forests, using for such purposes any special appropriation or any surplus money not otherwise appropriated, which may be standing to the credit of the State forestry fund.

The attorney general of the State is directed to see that all deeds to the State of lands mentioned in this section are properly executed before the gift is accepted or payment of the purchase money is made.

SEC. 4. That all moneys received from the sale of wood, timber, minerals, or other products from the State forests, and penalties for trespassing thereon, shall be paid into the State treasury, and shall constitute a State forestry fund, and the moneys in said fund are hereby appropriated for purposes of forestry in general, under the direction of the board of directors.

SEC. 5. That for the maintenance, use, and extension of the work under the board of directors, and for forest-fire protection, there is hereby appropriated the sum of $10,000 annually out of any moneys in the State treasury not otherwise appropriated, to be placed to the credit of the State forestry fund.

SEC. 6. That the board of directors may cooperate with the Federal Forest Service under such terms as may seem desirable.

SEC. 7. That all acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

The above law as originally drafted also contained in section 3 the following:

Said State forests shall be subject to county taxes assessed on the same basis as are private lands, to be paid out of any moneys in the State treasury not otherwise appropriated.

But this paragraph was struck out by the legislature since it is unconstitutional for the State to pay taxes.

HOW THE FEDERAL GOVERNMENT WILL AID.

The Federal Government offers aid in forestry to States along three different lines: (1) Demonstration work at State experiment stations, (2) farm woodlot management under the Smith-Lever law, and (3) fire protection under the Weeks law.

State experiment stations prepared to handle the work can secure cooperative assistance in investigating the proper methods of forest management, nursery practice, tree planting, and the like.

In connection with farm woodlot improvement the Forest Service is planning to get in direct touch with the farmer through the extension work of the United States Department of Agriculture and the States. This work has recently received a tremendous impetus through the passage of the Smith-Lever law. Under its terms a Federal appropriation is made each year to further agricultural extension work in the States through the medium of the extension staff of the State agricultural college. To avail itself of the funds provided by this law a State must appropriate for this particular line of work an amount equal to that made available by the Federal Government. The law makes possible much cooperative work between the Federal Government and State agricultural colleges through inspection and practical field demonstrations by agents of the United States Department of Agriculture. Cooperative projects

can be proposed by the State, but must be approved by the Department. Since woodlot management is to a large extent a farm problem, the aim is to acquaint the county field agents of the State extension service with the essential principles of woodlot management in order that they may show the farmer how to manage his woodlands. Such projects have already been conducted in Tennessee and Indiana.

Of most immediate concern to a State which is just organizing its forest work is the Federal cooperation which can be secured in fire protection. Under the Weeks law the sum of $100,000 was appropriated for the fiscal year 1916 for allotment to the States, to be expended in protecting the watersheds of navigable streams, provided the State establishes by law a system of fire protection and makes an appropriation therefor, and provided further, that the State expends at least as much as the Federal Government. This cooperation has been in effect for nearly five years, and the results secured in conserving our natural resources have far exceeded the anticipation of its most enthusiastic supporters. The States which are receiving funds under the law are: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Maryland, Virginia, West Virginia, North Carolina, Kentucky, Texas, Michigan, Wisconsin, Minnesota, South Dakota, Montana, Idaho, Oregon, and Washington, 21 in all. The remaining States in the southern pine region should not let the opportunity pass for securing cooperation of this character in keeping down their forest-fire losses.

PUBLICATIONS OF UNITED STATES DEPARTMENT OF AGRICULTURE RELATING TO THE CONSERVATION OF FORESTS.

AVAILABLE FOR FREE DISTRIBUTION.

Forest Planting in the Eastern United States. (Department Bulletin 153.)
The Northern Hardwood Forest: Its Composition, Growth, and Management. (Department Bulletin 285.)
Shortleaf Pine: Its Economic Importance and Forest Management. (Department Bulletin 308.)
Primer of Forestry. (Farmers' Bulletin 173.)
Primer of Forestry. Part 2—Practical Forestry. (Farmers' Bulletin 358.)
The Profession of Forestry. (Forestry Circular 207.)

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Forest Planting in Western Kansas. (Forestry Bulletin 52.) Price, 10 cents.
Working Plan for Forest Lands in Berkeley County, South Carolina. (Forestry Bulletin 56.) Price, 10 cents.
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